TRW *OPTRON*

ALLIED ELECTRONIC COMPONENTS
(PTY) LTD.
P.O. Box 6387
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CATALOG NO. 1085
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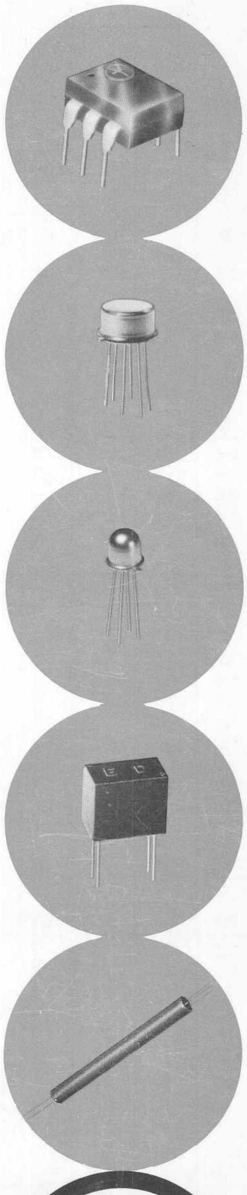
Optoelectronic Isolators and Chips



®Trademark TRW INC.

TRW OPTRON's optically coupled isolators contain a gallium arsenide infrared light emitting diode coupled to a phototransistor, photodarlington or photo SCR. A wide variety of package styles and electrical characteristics are offered to enable broad design flexibility. Standard package styles range from low cost plastic P-Dip types to high reliability TO-5 and TO-18 metal can types. Isolation voltages to 50 kV are available. TRW OPTRON specializes in the development and manufacture of custom optoelectronic assemblies. A standard device can be tested to your specifications, or a completely new product can be designed to satisfy your custom needs.

OPTICALLY COUPLED ISOLATORS – P-Dip Case Style

electrical characteristics (25°C unless otherwise noted)

SYMBOL	CTR			V_{ISO} (4)	$V_{(BR)\,CEO}$		$V_{CE\,(SAT)}$			$I_{C\,(OFF)}$	V_F		t_r, t_f			#
PARAMETER	Current Transfer Ratio			DC Isolation Volatge	Collector-Emitter Breakdown		Saturation Voltage			Collector Dark Current	LED Forward Voltage		Response Time		Output Configuration	Case Number
TEST CONDITIONS	I_F and V_{CE} as shown			Input to Output	I_C as shown		I_F and I_C as shown			I_F = 0 V_{CE} = 10 V	I_F as shown		V_{CC} = 10 V R_L = 100 Ω I_C = 2 mA			
UNIT	%	I_F	V_{CE}	V	V	I_C	V	I_F	I_C	nA	V	I_F	μ sec			
LIMIT	MIN	mA	V	MIN	MIN	mA	MAX	mA	mA	MAX	MAX	mA	TYP			
OPI 2100	150	10	5	4000	30	1	0.4	32	16	50, V_{CE} = 5 V	1.5	40	4		Transistor	1
	50	3.2	0.4													
OPI 2150	2	10	5	1500	20	1	0.5	50	2.0	100	1.5	10	2		Transistor	1
OPI 2151	10	10	5	1500	30	1	0.4	10	0.25	100	1.5	10	2		Transistor	1
OPI 2152	20	10	5	1500	30	1	0.4	16	2.0	50	1.4	16	3		Transistor	1
OPI 2153	50	10	5	1500	30	1	0.4	16	4.0	50	1.4	16	3		Transistor	1
OPI 2154	10	0.5	0.5	1500	30	1	.35	5	1	50	1.5	10	2		Transistor	1
OPI 2155	20	1	0.5	1500	30	1	.35	5	1	50	1.5	10	2		Transistor	1
OPI 2250	2	10	5	2500	20	1	0.5	50	2.0	100	1.5	10	2		Transistor	1
OPI 2251	10	10	5	2500	30	1	0.4	10	0.25	100	1.5	10	2		Transistor	1
OPI 2252	20	10	5	2500	30	1	0.4	16	2.0	50	1.4	16	3		Transistor	1
OPI 2253	50	10	5	2500	30	1	0.4	16	4.0	50	1.4	16	3		Transistor	1
OPI 2254	10	0.5	0.5	2500	30	1	.35	5	1	50	1.5	10	2		Transistor	1
OPI 2255	20	1	0.5	2500	30	1	.35	5	1	50	1.5	10	2		Transistor	1
OPI 2500	12.5	±16	0.4	1500	30	1	0.4	±16	2.0	50	1.5	±10	2		Transistor	1
													Note (2) t_r	t_f		
OPI 3150	300	10	2	1500	30	0.1	1.0	10	10	100	1.5	10	3	25	Darlington	1
OPI 3151	300	10	1	1500	30	0.1	1.0	50	50	100	1.5	10	3	25	Darlington	1
OPI 3152	300	10	1	1500	55	0.1	1.0	50	125	100	1.5	10	3	25	Darlington	1
OPI 3153	500	1	5	1500	30	1	1.0	1.0	1.0	100	1.5	10	3	25	Darlington	1
OPI 3250	300	10	2	2500	30	0.1	1.0	10	10	100	1.5	10	3	25	Darlington	1
OPI 3251	300	10	1	2500	30	0.1	1.0	50	50	100	1.5	10	3	25	Darlington	1
OPI 3252	300	10	1	2500	55	0.1	1.0	50	125	100	1.5	10	3	25	Darlington	1
OPI 3253	500	1	5	2500	30	1	1.0	1.0	1.0	100	1.5	10	3	25	Darlington	1
OPI 5000A	20	10	5	5000	30	1	0.4	16	2	50	1.4	16	3		Transistor	1
OPI 5010A	10	10	5	5000	20	1	0.4	10	.25	100	1.5	10	3		Transistor	1
													t_r	t_f		
OPI 6100	10	10	5	1500	200	1	0.4	10	0.5	100, V_{CE} = 100 V	1.5	10	3	2.5	Transistor	1
4N25	20	10	10	2500	30	1	0.5	50	2.0	50	1.5	10	2		Transistor	1
4N26	20	10	10	1500	30	1	0.5	50	2.0	50	1.5	10	2		Transistor	1
4N27	10	10	10	1500	30	1	0.5	50	2.0	50	1.5	10	2		Transistor	1
4N28	10	10	10	500	30	1	0.5	50	2.0	100	1.5	10	2		Transistor	1
													Note (3) t_r	t_f		
4N29	100	10	10	2500	30	.1	1.0	8	2.0	100	1.5	10	0.6	17	Darlington	1
4N30	100	10	10	1500	30	.1	1.0	8	2.0	100	1.5	10	0.6	17	Darlington	1
4N31	50	10	10	1500	30	.1	1.2	8	2.0	100	1.5	10	0.6	17	Darlington	1
4N32	500	10	10	2500	30	.1	1.0	8	2.0	100	1.5	10	0.6	45	Darlington	1
4N33	500	10	10	1500	30	.1	1.0	8	2.0	100	1.5	10	0.6	45	Darlington	1
4N35	100	10	10	2500 AC	30	1	0.3	10	0.5	50	1.5	10	3		Transistor	1
4N36	100	10	10	1750 AC	30	1	0.3	10	0.5	50	1.5	10	3		Transistor	1
4N37	100	10	10	1050 AC	30	1	0.3	10	0.5	50	1.5	10	3		Transistor	1
4N38	20	20	1	1500	80	1	1.0	20	4.0	50(1)	1.5	10	2		Transistor	1
4N38A	20	20	1	2500	80	1	1.0	20	4.0	50(1)	1.5	10	2		Transistor	1
CNY 17/I	40	10	5	4000	70	1	0.4	10	2.5	50	1.65	60	2		Transistor	1
CNY 17/II	63	10	5	4000	70	1	0.4	10	2.5	50	1.65	60	2		Transistor	1
CNY 17/III	100	10	5	4000	70	1	0.4	10	2.5	50	1.65	60	2		Transistor	1

Notes: (1) Measured @ V_{CE} = 60 V (2) Test conditions: V_{CC} = 10 V, R_L = 20 Ω, I_C = 50 mA (3) Test conditions: V_{CC} = 10 V, I_C = 50 mA, I_F = 200 mA (pulsed)
(4) Test conditions: 60 Hz full wave rectification, 1 sec. duration, input leads shorted together and output leads shorted together.

OPTICALLY COUPLED ISOLATORS — P-Dip Case Style

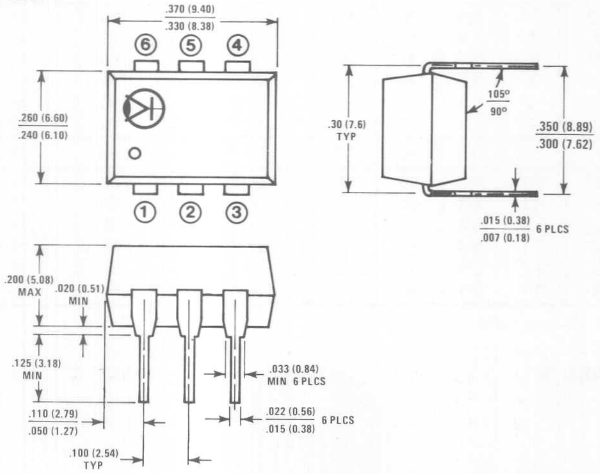
TRW OPTRON's series of optically coupled SCR output isolators each contain a gallium arsenide, infrared light emitting diode coupled to a PNPN planar photo activated silicon controlled rectifier in a six pin dual-in-line package. Featured are 2500 $V_{(PK)}$ (OPI 4201, OPI 4401, and OPI 4501) and 1500 $V_{(PK)}$ (OPI 4202, OPI 4402, and OPI 4502) input-to-output surge isolation voltage.

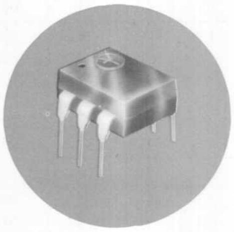
electrical characteristics (25°C unless otherwise noted)

SYMBOL	V_{DM}	V_{ISO} (4)		$I_{(LED)T}$						V_{TM}			I_{DM}		V_F	I_R		#
PARAMETER	Peak Off-State Voltage	Steady State Isolation Voltage		Input Current to Trigger						On-State Voltage			Off-State Current		Diode Forward Voltage	Diode Reverse Current	Output Configuration	Case Number
TEST CONDITIONS	R_{GK} = 10 kΩ T_A = 100°C	Input to Output		V_{AK} and R_{GK} as shown						I_F and I_{TM} as shown			R_{GK} = 10 kΩ T_A = 100°C V_{DM} as shown		I_F = 10 mA	V_R = 3 V		
UNIT	V	V	V	mA	V_{AK}	R_{GK}	mA	V_{AK}	R_{GK}	V	I_F	I_{TM}	µA	V_{DM}	V	µA		
LIMIT	MIN	PEAK	RMS	MAX	V	Ω	MAX	V	Ω	MAX	mA	mA	MAX	V	MAX	MAX		
OPI 4201	200	1500	1060	20	50	10	11	100	27	1.3	30	300	50	200	1.5	10	SCR	1
OPI 4202	200	950	660	30	50	10	14	100	27	1.3	30	300	50	200	1.5	10	SCR	1
OPI 4401	400	1500	1060	20	50	10	11	100	27	1.3	30	300	150	400	1.5	10	SCR	1
OPI 4402	400	950	660	30	50	10	14	100	27	1.3	30	300	150	400	1.5	10	SCR	1
OPI 4501	550	1500	1060	30	50	10	14	100	27	1.3	30	300	150	550	1.5	10	SCR	1
OPI 4502	550	950	660	40	50	10	22	100	27	1.3	30	300	150	550	1.5	10	SCR	1

V_{AK} is anode-to-cathode voltage. R_{GK} is gate-to-cathode resistance.

CASE 1





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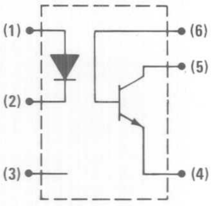
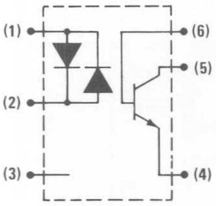


OPI 2500 ONLY



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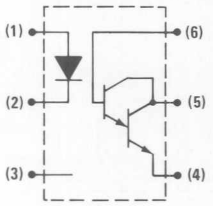
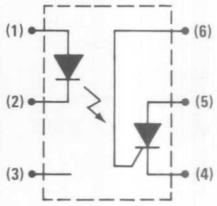


PHOTO SCR



Dimensions are in Inches (Millimeters)

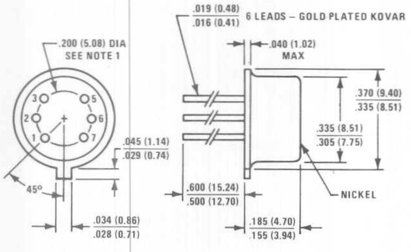
OPTICALLY COUPLED ISOLATORS – Metal Can Case Style

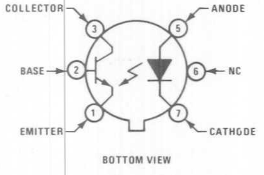
electrical characteristics (25°C unless otherwise noted)

SYMBOL	CTR			V_{ISO}	$V_{(BR)CEO}$		$V_{CE(SAT)}$			$I_{C(OFF)}$	V_F		t_r, t_f		#
PARAMETER	Current Transfer Ratio			DC Isolation Voltage	Collector Breakdown Voltage		Saturation Voltage			Collector Dark Current	LED Forward Voltage		Response Time	Output Configuration	Case Number
TEST CONDITIONS	I_F and V_{CE} as shown			Input to Output	H = 0, I_C as shown		I_F and I_C as shown			I_F = 0 V_{CE} = 20 V	I_F as shown		V_{CC} = 10 V R_L = 100 Ω I_F = 10 mA		
UNIT	%	I_F	V_{CE}	V	V	I_C	V	I_F	I_C	nA	V	I_F	µsec		
LIMIT	MIN	mA	V	MIN	MIN	mA	MAX	mA	mA	MAX	MAX	mA	TYP		
4N22A	25	10	5	1000	35	1	0.3	20	2.5	100	1.3	10	15	Transistor	2
4N23A	60	10	5	1000	35	1	0.3	20	5	100	1.3	10	15	Transistor	2
4N24A	100	10	5	1000	35	1	0.3	20	10	100	1.3	10	20	Transistor	2
JAN 4N22A	25	10	5	1000	35	1	0.3	20	2.5	100	1.3	10	15	Transistor	2
JAN 4N23A	60	10	5	1000	35	1	0.3	20	5	100	1.3	10	15	Transistor	2
JAN 4N24A	100	10	5	1000	35	1	0.3	20	10	100	1.3	10	20	Transistor	2
JAN TX 4N22A$^{(1)}$	25	10	5	1000	35	1	0.3	20	2.5	100	1.3	10	15	Transistor	2
JAN TX 4N23A$^{(1)}$	60	10	5	1000	35	1	0.3	20	5	100	1.3	10	15	Transistor	2
JAN TX 4N24A$^{(1)}$	100	10	5	1000	35	1	0.3	20	10	100	1.3	10	20	Transistor	2
JAN TXV 4N22A$^{(1)}$	25	10	5	1000	35	1	0.3	20	2.5	100	1.3	10	15	Transistor	2
JAN TXV 4N23A$^{(1)}$	60	10	5	1000	35	1	0.3	20	5	100	1.3	10	15	Transistor	2
JAN TXV 4N24A$^{(1)}$	100	10	5	1000	35	1	0.3	20	10	100	1.3	10	20	Transistor	2
OPI 102	25	10	5	1000	35	1	0.3	20	2.5	100	1.3	10	15	Transistor	2
OPI 103	100	10	5	1000	35	1	0.3	20	10	100	1.3	10	20	Transistor	2
OPI 130	200	10	2	1000	25	1	1.0	5	1.0	100$^{(2)}$	1.5	10	50	Darlington	2
3N243	1.5	10	10	1000	30	1	0.3	20	1.5	100$^{(2)}$	1.3	10	10	Transistor	3
3N244	3	10	10	1000	30	1	0.3	20	3	100$^{(2)}$	1.3	10	10	Transistor	3
3N245	6	10	10	1000	30	1	0.3	20	6	100$^{(2)}$	1.3	10	15	Transistor	3
3N243R$^{(1)}$	1.5	10	10	1000	30	1	0.3	20	1.5	100$^{(2)}$	1.3	10	10	Transistor	3
3N244R$^{(1)}$	3	10	10	1000	30	1	0.3	20	3	100$^{(2)}$	1.3	10	10	Transistor	3
3N245R$^{(1)}$	6	10	10	1000	30	1	0.3	20	6	100$^{(2)}$	1.3	10	15	Transistor	3
OPI 140	15	10	10	1000	30	1	0.5	40	1.6	50$^{(2)}$	1.5	40	10	Transistor	3
3C91A	10	10	5	500	50	0.1	0.4	50	2	100$^{(3)}$	1.8	50	10	Transistor	4
3C91B	20	10	5	500	50	0.1	0.4	50	2	100$^{(3)}$	1.8	50	10	Transistor	4
3C91C	40	10	5	500	50	0.1	0.4	50	2	100$^{(3)}$	1.8	50	10	Transistor	4
3C92A	10	10	5	500	50	0.1	0.4	50	2	100$^{(3)}$	1.8	50	10	Transistor	4
3C92B	20	10	5	500	50	0.1	0.4	50	2	100$^{(3)}$	1.8	50	10	Transistor	4
3C92C	40	10	5	500	50	0.1	0.4	50	2	100$^{(3)}$	1.8	50	10	Transistor	4

Notes: (1) High reliability processed (See page 6) (2) V_{CE} = 10 V (3) V_{CE} = 5 V

CASE 2





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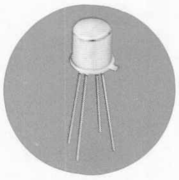

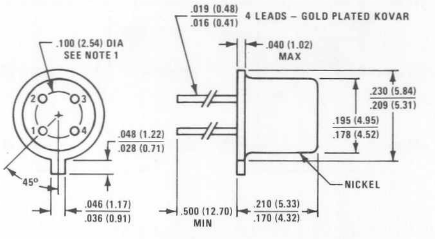

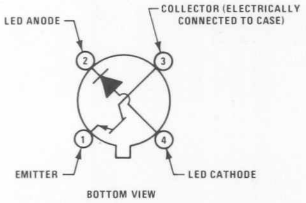

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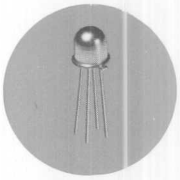
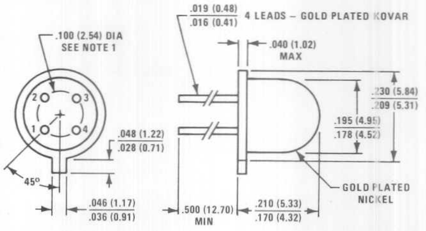
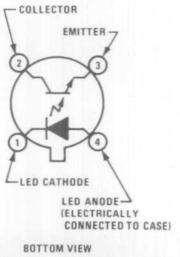
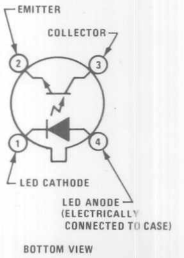




3C91A, B, C



3C92A, B, C



Note 1: This dimension is controlled at the housing surface.   Dimensions are in Inches (Millimeters)

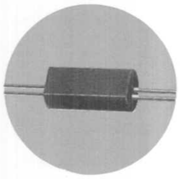
OPTICALLY COUPLED ISOLATORS — Plastic Case Style

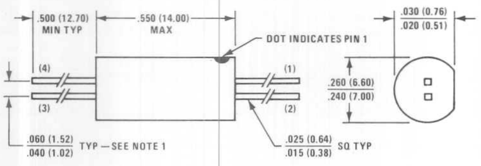
electrical characteristics (25°C unless otherwise noted)

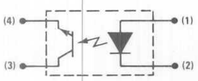
SYMBOL	CTR			V_{ISO}	$V_{(BR)CEO}$		$V_{CE(SAT)}$			$I_{C(OFF)}$	V_F		t_r, t_f			#
PARAMETER	Current Transfer Ratio			DC Isolation Voltage	Collector Breakdown Voltage		Saturation Voltage			Collector Dark Current	LED Forward Voltage		Response Time		Output Configuration	Case Number
TEST CONDITIONS	I_F and V_{CE} as shown			Input to Output	H = 0, I_C as shown		I_F and I_C as shown			I_F = 0 V_{CE} = 10 V	I_F as shown		V_{CC} = 10 V R_L = 100 Ω I_F = 10 mA			
UNIT	%	I_F	V_{CE}	V	V	I_C	V	I_F	I_C	nA	V	I_F	μsec			
LIMIT	MIN	mA	V	MIN	MIN	mA	MAX	mA	mA	MAX	MAX	mA	TYP			
OPI 110	12.5	16	5	10,000	30	1	0.4	16	1.8	100	1.5	20	2		Transistor	5
OPI 113	50	16	2	10,000	25	1	1.2	16	5	100	1.5	10	3, 25⁽¹⁾		Darlington	5
OPI 120	20	10	5	15,000	25	1	0.5	30	1	100	1.5	30	2		Transistor	6
OPI 123	50	10	2	15,000	20	1	1.2	10	2	100	1.5	10	3, 25⁽¹⁾		Darlington	6
OPI 150	10	10	5	50,000	30	1	0.5	16	1	100	1.6	50	2		Transistor	7
OPI 153	25	20	5	50,000	15	1	1.2	30	2	100	1.6	50	3, 25⁽¹⁾		Darlington	7
													t_{on}	t_{off}		
OPI 1264A⁽⁵⁾	25	10	5	10,000	32	1	0.4	10	1.6	200⁽²⁾	1.5	20	4	3⁽³⁾	Transistor	8
OPI 1264B⁽⁵⁾	50	10	5	10,000	32	1	0.4	10	1.6	200⁽²⁾	1.5	20	4	3⁽³⁾	Transistor	8
OPI 1264C⁽⁵⁾	100	10	5	10,000	32	1	0.4	10	1.6	200⁽²⁾	1.5	20	4	3⁽³⁾	Transistor	8
OPI 7002	20	10	10	6,000	30	1	0.4	10	0.5	100	1.7	10	3	3⁽³⁾	Transistor	9
OPI 7010	100	10	10	6,000	30	1	0.4	10	0.5	100	1.7	10	3	3⁽³⁾	Transistor	9
OPI 7320	200	5	5	6,000	30	1	1	5	2	100	1.5	10	150	125⁽⁴⁾	Darlington	9
OPI 7340	400	5	5	6,000	30	1	1	5	2	100	1.5	10	150	125⁽⁴⁾	Darlington	9

Notes: (1) V_{CC} = 10 V, R_L = 20 Ω, I_F = 50 mA (2) V_{CE} = 20 V (3) V_{CC} = 10 V, R_L = 100 Ω, I_C = 2 mA (4) V_{CC} = 10 V, R_L = 100 Ω, I_C = 10 mA (5) UL and V_{DE} approved

CASE 5







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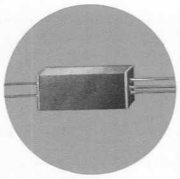

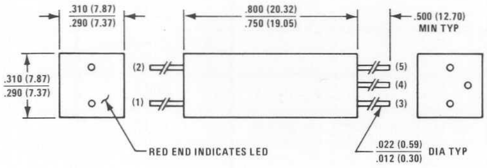

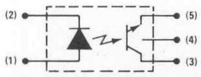

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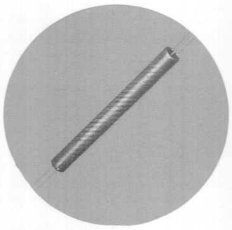
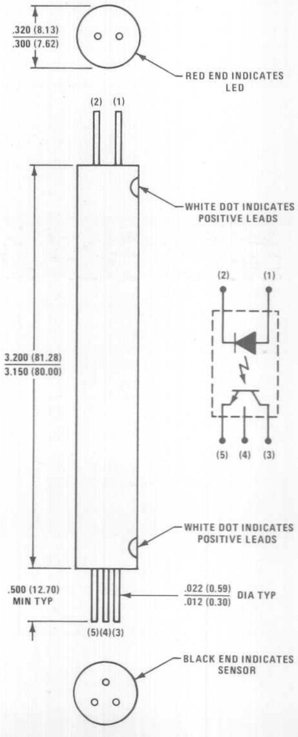
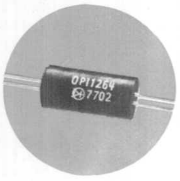
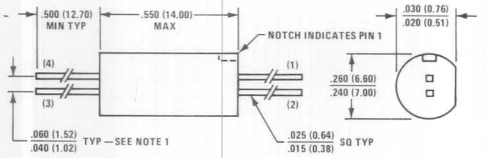
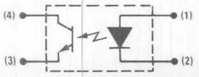




CASE 8







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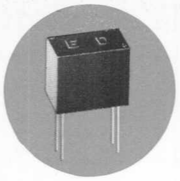
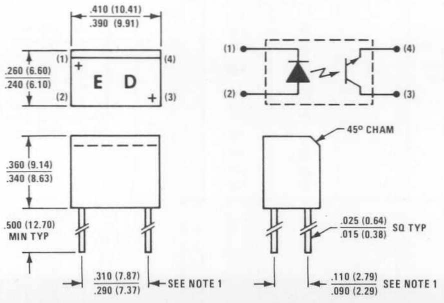




Note 1: This dimension is controlled at the housing surface. Dimensions are in Inches (Millimeters)

HIGH RELIABILITY PROCESSING

TRW OPTRON manufactures several types of metal can couplers which are processed to Military Specification 19500/486A and Military Standard 750. Once units complete this rigorous testing, they are referred to as "high reliability" processed. The purpose of high reliability processing is to weed out the potentially weak or early failure unit which might go undetected in regular processing. High reliability processing also makes it possible to guarantee certain levels of performance under harsh environmental and electrical conditions.

TRW OPTRON's metal can couplers, because of their advanced design, have compiled impressive results during high reliability testing. As of this printing, over 1,650,000 device-hours have been completed on Operating Life test without a failure, and over 90,000 devices have completed Monitored Temperature Cycle without a catastrophic failure.

The following is a summary of TRW OPTRON's high reliability testing sequence.

100% Manufacturing Processing

Test Required (MIL-S-19500/486A)	Test Method (MIL-STD-750)	3N243R 3N244R 3N245R	JAN 4N22A JAN 4N23A JAN 4N24A	JAN TX 4N22A JAN TX 4N23A JAN TX 4N24A	JAN TXV 4N22A JAN TXV 4N23A JAN TXV 4N24A
Pre-Cap Visual Inspection	2072	TRW Optron Spec 50-00005-205	–	–	–
Initial Electrical Testing	–	X	–	X	X
High Temperature Storage, $T_A = 125^oC$, $t = 72$ hrs.	–	$T_A = 150^oC$ $t = 48$ hrs	–	X	X
Temperature Cycle, 10 cycles, 15 min. each extreme	1051, Condition B	X	–	X	X
Constant Acceleration, Non Operating, 20,000 G, Y only	2006	X	–	X	X
Hermetic Seal, fine and gross	1071, Condition C or D, G or H	X	–	X	X
Electrical Testing	–	X	–	X	X
High Temperature Reverse Bias, $T_A = 125^oC$, $I_F = 0$, $V_{CB} = 20$ V, $t = 96$ hrs.	1039, Condition A	$V_{CE} = 20$ V	–	X	X
Electrical Testing	–	–	–	X	X
Power Burn-in, $V_{CE} = 10$ V, $P_t = 275$ mW $\pm$ 25 mW, $I_F = 40$ mA, $T_A = 25^oC$, $t = 168$ hrs.	1039, Condition A	$P_t = 175$-200 mW	–	X	X
Electrical Testing	–	X	–	X	X
Monitored Temperature Cycle, 1 cycle, 15 min. each extreme	1051, Condition B	–	–	X	X
Radiographic Inspection	2076	When Specified	When Specified	When Specified	When Specified
Hermetic Seal, fine and gross	1071, Condition C or D, G or H	–	–	X	X
External Visual Examination	2071	–	–	X	X
High Temperature Isolation Voltage, $V_{ISO} = 150$ V, $T_A = 150^oC$, $t = 24$ hrs.	1016	–	–	X	X
Final Electrical Testing	–	–	–	X	X

Quality and Reliability Lot Acceptance Testing

Sub Group	Test Required (MIL-S-19500/486A)	Test Method (MIL-STD-750)	Sample Size (Accept on 1 Failure)			
			3N–	JAN	JAN TX	JAN TXV
Electrical Testing						
A1	Visual & Mechanical	2071	.65 AQL	38	55	55
A2	Electrical – LED	–	.65 AQL	55	77	77
A3	Electrical – Transistor	–	.65 AQL	55	77	77
A4	Electrical – Combination	–	.65 AQL	55	77	77
A5	Electrical – High Temp.	–	.65 AQL	38	55	55
A6	Electrical – Low Temp	–	.65 AQL	38	55	55
Environmental Testing						
B1	Solderability	2026	–	25	25	25
B1	Thermal Shock (Temp. Cycle)	1051, Condition B	–	25	25	25
B1	Thermal Shock (Glass Drain)	1056, Condition A	–	25	25	25
B1	Hermetic Seal	1071, Condition C or D, G or H	–	25	25	25
B1	Moisture Resistance	1021	–	25	25	25
B1	End Points	–	–	25	25	25
B2	Shock	2016	–	38	38	38
B2	Vibration, Variable Freq.	2056	–	38	38	38
B2	Constant Acceleration	2006	–	38	38	38
B2	End Points	–	–	38	38	38

Sub Group	Test Required (MIL-S-19500/486A)	Test Method (MIL-STD-750)	Sample Size (Accept on 1 Failure)			
			3N–	JAN	JAN TX	JAN TXV
Environmental Testing (Continued)						
B3	High Temperature Isolation	1016	–	18	18	18
B3	End Points	–	–	18	18	18
C1	Barometric Pressure (reduced)	1001	–	38	38	38
C2	Physical Dimensions	2066	–	18	18	18
C3	Resistance to Solvents	MIL-STD-202 Method 215	–	38	38	38
C4	Terminal Strength	2036, Condition E	–	38	38	38
C5	Salt Atmosphere (corrosion)	1041	–	38	38	38
Life Testing						
B4	High Temp. Life (non-operating)	1032	–	55	77	77
B5	Steady State Operating Life	1027	–	55	77	77
C6	High Temp. Life (non-operating)	1032	–	55	77	77
C7	Steady State Operating Life	1027	–	55	77	77

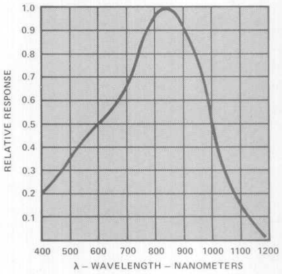
Note: Group C testing is performed once each six months and on one JAN device type.

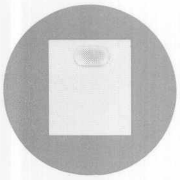
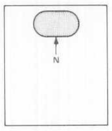
TRW Optron reserves the right to make changes at any time in order to improve design and to supply the best product possible.

OPTOELECTRONIC CHIPS

The broad line of TRW OPTRON photosensor and infrared light emitting diode chips meets the requirements of most optoelectronic applications. Silicon sensor chips are offered in PIN photodiode, photo transistor, and photodarlington configurations. Versions are also available which optimize either maximum sensitivity or maximum current handling capacity. All TRW OPTRON sensor chips utilize silicon nitride passivation for the utmost in long term stability. Sensor chips can be specially probed to satisfy custom requirements. Gallium arsenide LED chips are fabricated by solution epitaxial techniques providing the highest efficiency and longest operating life available. Spectral emission is centered at 935 nanometers. LED chips of 120 sq. mils provide the highest output at low current levels, and 256 sq. mil chips offer high average current levels, especially in pulse applications.

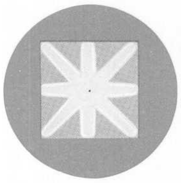
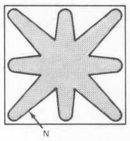
FIGURE 1.
PHOTOSENSOR SPECTRAL RESPONSE



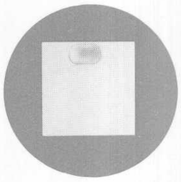
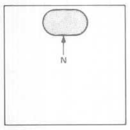
OPC 123 GaAs LED

N = Cathode Contact
P = Anode Contact (on bottom of chip)
Chip Size = .010 (0.25) x .012 (0.30)
P_O, Total optical power, 2.0 mW minimum @ I_F = 50 mA
V_F = 1.5 V typical @ I_F = 50 mA
I_R = 100 μA minimum @ V_R = 3.0 V
λp = 935 nm typical

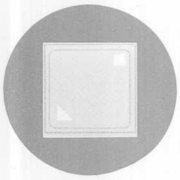
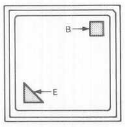
OPC 124 GaAs LED

N = Cathode Contact
P = Anode Contact (on bottom of chip)
Chip Size = .016 (0.41) x .016 (0.41)
P_O, Peak radiant power, 15 mW minimum @ I_F = 1 A, PW = 100 μs, 10 pps
V_F = 2.5 V maximum @ I_F = 1 A, PW = 100 μs, 10 pps
I_R = 100 μA minimum @ V_R = 2.0 V
λp = 935 nm typical

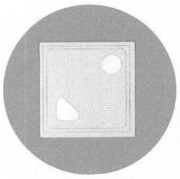
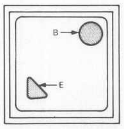
OPC 116 GaAs LED

N = Cathode Contact
P = Anode Contact (on bottom of chip)
Chip Size = .016 (0.41) x .016 (0.41)
P_O, Total optical power, 2.0 mW minimum @ I_F = 50 mA
V_F = 1.5 V typical @ I_F = 50 mA
I_R = 100 μA minimum @ V_R = 3.0 V
λp = 935 nm typical

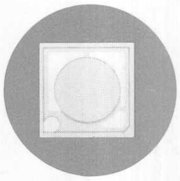
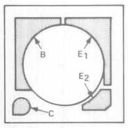
OPC 60X Phototransistor

E = Emitter
B = Base
C = Collector Contact (on bottom of chip)
Chip Size = .040 (1.02) x .040 (1.02)
Sensitive Area = .033 (0.84) x .033 (0.84)
$V_{(BR)CEO}$ = 30 V minimum @ I_C = 100 μA
$V_{(BR)ECO}$ = 5 V minimum @ I_E = 100 μA
I_{CEO} = 100 nA @ V_{CE} = 10 V
I_L = 0.8 mA to 22 mA @ V_{CE} = 5 V, H = 5.0 mW/cm^2 (Note 1 and 2)
Spectral Response: See Figure 1

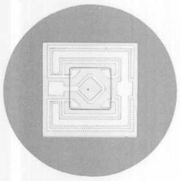
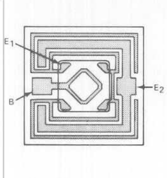
OPC 600L Phototransistor

E = Emitter
B = Base
C = Collector Contact (on bottom of chip)
Chip Size = .025 (0.64) x .025 (0.64)
Sensitive Area = .020 (0.51) x .020 (0.51)
$V_{(BR)CEO}$ = 45 V minimum @ I_C = 100 μA
$V_{(BR)ECO}$ = 7 V minimum @ I_E = 100 μA
I_{CEO} = 100 nA maximum @ V_{CE} = 10 V
I_L = 0.8 mA to 10 mA @ V_{CE} = 5 V, H = 20 mW/cm^2 (Note 1 and 2)
Spectral Response: See Figure 1

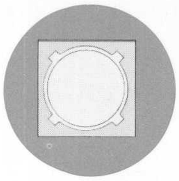
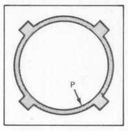
OPC 300 Photodarlington

E_1 = Phototransistor Emitter
E_2 = Amplifier Emitter
B = Phototransistor Base
C = Common Collector (on bottom of chip)
Chip Size = .025 (0.64) x .025 (0.64)
Sensitive Area = .017 (0.43) diameter
$V_{(BR)CEO}$ = 30 V minimum @ I_C = 100 μA
$V_{(BR)ECO}$ = 5 V minimum @ I_E = 100 μA
I_{CEO} = 250 nA maximum @ V_{CE} = 10 V
I_L = 0.8 mA to 10 mA @ V_{CE} = 5 V, H = 1.0 mW/cm^2 (Note 1 and 2)
Spectral Response: See Figure 1

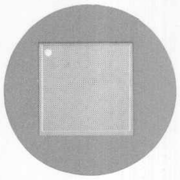
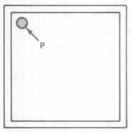
OPC 300M Photodarlington

E_1 = Phototransistor Emitter
E_2 = Amplifier Emitter
B = Phototransistor Base
C = Common Collector (on bottom of chip)
Chip Size = .025 (0.64) x .025 (0.64)
$V_{(BR)CEO}$ = 30 V minimum @ I_C = 100 μA
$V_{(BR)ECO}$ = 5 V minimum @ I_E = 100 μA
I_{CEO} = 250 nA @ V_{CE} = 10 V
I_L = 1.0 mA to 20 mA @ V_{CE} = 5 V, H = 1.0 mW/cm^2 (Note 1 and 2)
Spectral Response: See Figure 1

OPC 910 PIN Photodiode

P = Anode Contact
N = Cathode Contact (on bottom of chip)
Chip Size = .050 (1.27) x .050 (1.27)
Sensitive Area = .041 (1.04) diameter
I_L = 50 μA minimum @ V_R = 5 V, H = 5 mW/cm^2, λ = 935 nm typical
I_D = 25 nA maximum @ V_R = 10 V
$V_{(BR)R}$ = 50 V minimum @ I_R = 100 μA

OPC 913 PIN Photodiode

P = Anode Contact
N = Cathode Contact (on bottom of chip)
Chip Size = .120 (3.05) x .120 (3.05)
Sensitive Area = .108 (2.70) x .108 (2.70)
I_L = 40 μA minimum @ V_R = 5 V, H = 1 mW/cm^2, λ = 935 nm typical
I_D = 25 nA maximum @ V_R = 10 V
$V_{(BR)R}$ = 33 V minimum @ I_R = 100 μA

Note 1: Radiation source is a tungsten lamp operated at a color temperature of 2870° K   Note 2: I_L specified is dependent on chip being mounted in package
Dimensions are in Inches (Millimeters)